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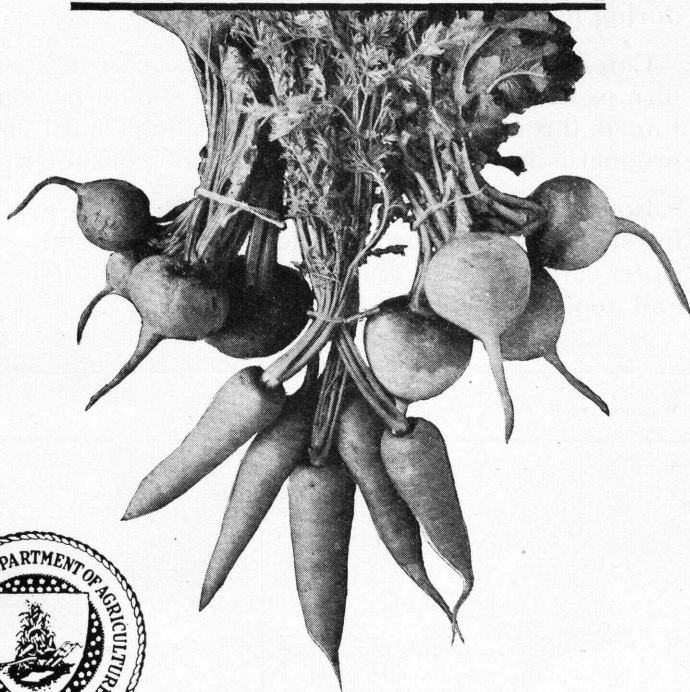
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U. S. DEPARTMENT OF AGRICULTURE

FARMERS' BULLETIN No. 1594



PREPARATION OF BUNCHED BEETS CARROTS AND TURNIPS *for* MARKET



THIS BULLETIN describes methods of harvesting, grading, packing, loading, and refrigerating bunched beets, carrots, and turnips practiced by successful shippers.

Well-graded and carefully handled bunched vegetables shipped under proper refrigeration from southern and western producing sections arrive on far-distant markets in a fresh, attractive condition during the winter and spring months.

Careful handling of bunched beets, carrots, and turnips should begin in the field and should be continued through all marketing operations until the product is in the hands of the ultimate consumer.

Rough handling, whether in the field, at the packing shed, in transit, or at the jobbers' or the retailers' store, causes breaking, crushing, or bruising of tops and roots and resultant deterioration.

PREPARATION OF BUNCHED BEETS, CAR- ROTS, AND TURNIPS FOR MARKET¹

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IMPORTANCE OF THE CROPS

CAR-LOT SHIPMENTS of bunched vegetables have increased rapidly during the last decade. Improved methods of handling and better grading practices, together with modern methods of refrigeration and rapid transportation, have tended greatly to increase the consumption of fresh beets, carrots, and turnips. Since bunched beets, carrots, and turnips are now common on the winter market and, as it is now possible to secure a greater variety of vegetables at all times of the year than was formerly the case, stored root vegetables are relatively less important.

The usefulness of root vegetables is not limited to their underground portions, since the leaves and stems of many root vegetables are frequently used as potherbs. Beet and turnip tops are most commonly used in this way.

PRODUCING AREAS

The larger number of the car-lot shipments of bunched carrots originate in California, Texas, Louisiana, and Mississippi. Bunched beets are shipped in considerable quantities from the last three States, and Texas and Louisiana also ship a considerable quantity of bunched turnips. Bunched vegetables are shipped in both straight car lots and in mixed car lots, the latter consisting principally of beets and carrots. Many shipments of winter vegetables are also made in less than car lots.

Shipments of bunched vegetables from California are made during every month in the year, the heaviest from October to June, but relatively few during July, August, and September.

¹ This bulletin treats principally of the handling practices in California, Texas, Louisiana, and Mississippi, where the bulk of winter and early spring shipments of these vegetables originate.

The car-lot movement of bunched vegetables from Texas and Louisiana occurs during a period extending from December to June; Mississippi shipments are made principally during April, May, and June.

TYPES AND VARIETIES

Carrots grown for winter shipment are mostly of the half-long type, the Chantenay and the Danvers Half Long varieties predominating, though Nantes and some Oxheart carrots are grown commercially.

Crosby's Egyptian and Early Blood Turnip beets are two of the most common varieties grown for shipment from Southern States. These beets are round in shape and are of blood-red color.

The Purple Top White Globe turnip is perhaps the most common type grown in the Gulf Coast States. This turnip, as its name implies, is of globular shape and has white flesh. The upper portion of the root has a purple skin, and the remainder is white.

HARVESTING

Bunched vegetables should be packed into shipping containers as soon as possible after removal from the ground, to lessen the possibility of damage by wilting and shriveling. As these vegetables generate heat rapidly they should never be left in piles longer than is absolutely necessary. If they can not be packed very soon after harvesting several scoops of ice should be scattered throughout the piles. Sometimes vegetables are exposed so long to the hot sun and drying winds that the tops become badly wilted and the roots flabby and shriveled. It is inadvisable to pull or plow up vegetables very far ahead of the bunchers.

There are several methods of harvesting beets, carrots, and turnips. In Texas, when the round stave bushel basket is used and no ice is packed within the container, bunched vegetables are commonly packed in the shipping container in the field. (Fig. 1.) One set of workers pull the vegetables from the ground and place them in piles. Here other workers immediately grade, bunch, and pack them into the baskets. With this method the vegetables receive a minimum of handling and accordingly are less subject to damage by bruising, breaking, and crushing of stems and leaves, or shriveling of the roots by exposure to sun and wind. Successful shippers provide competent foremen in the fields to supervise the grading and packing. Workers are instructed as to the uniform sizing of individual specimens within the bunch and the kind of stock which should be left in the field.

This method of harvesting can not be followed when packages are to be iced. In that case they must be hauled to a central packing shed where there are facilities for properly icing the packages.

Under another method of harvesting, which is used to a considerable extent in some sections, the workers bunch the vegetables as they are pulled and place them on the ground near the row. The bunches are later stacked in rows on wagons and hauled to the packing shed, where they are packed into the shipping containers.

Under another method which is sometimes employed, the vegetables are tossed into piles as they are pulled from the ground and are

later tossed into wagons or trucks, hauled to the packing shed, and tossed onto the platform, where they are finally bunched and packed in containers. This method of harvesting is objectionable because of the frequent rough handling of the vegetables. When carloads are to be made up of several growers' lots, it is often advisable to bunch the vegetables at a central packing shed where they may be uniformly graded and sized under careful supervision.

Bunched carrots are usually harvested when the roots are about 1 to 3 inches (mostly $1\frac{1}{4}$ to $2\frac{1}{4}$ inches) in diameter. The size of beets generally ranges from $1\frac{1}{2}$ to $3\frac{1}{2}$ inches (mostly $1\frac{3}{4}$ to $2\frac{1}{2}$ inches) in diameter. When harvested for bunching, turnips range from about $1\frac{3}{4}$ to 4 inches (mostly 2 to $3\frac{1}{4}$ inches) in diameter. Sometimes when turnips are marketed principally for their tops, little attention is paid to the minimum size of the roots.

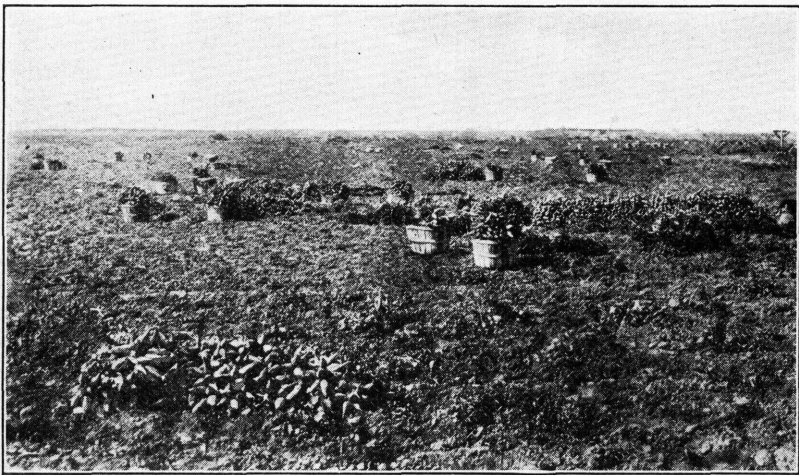


FIGURE 1.—Bunched carrots, packed in baskets in the field, and in piles on ground waiting to be packed into baskets. Bunched vegetables should be packed into containers and loaded into cars as soon as possible after pulling from the ground

GRADING

Standardization of bunched vegetables has shown rapid progress during the last few years. With the realization that ungraded products depress the market and that graded products are always in demand, the more alert growers and shippers are insisting that inferior stock be left at home.

Proper grading and packing of bunched vegetables at various shipping points has gone a long way toward increasing the consumption of these products and, in conjunction with more efficient refrigeration in transit, has widened their distribution to such an extent that fresh bunched vegetables such as beets, carrots, and turnips may now be found on the markets during practically the entire year.

With United States grades for various bunched vegetables as a basis on which to work, greater efforts are being made to put up more attractive packages of products of superior quality, which will have a direct appeal not only to the car-lot receiver, the jobber, and the

retailer, but to the housewife as well. She it is who must be given important consideration in any scheme which aims to increase the demand for any given food product.

Such factors as the proper sizing of bunches, uniformity of sizing of the individual specimens within the bunch, cleanliness and fresh-

ness of stock, the general appearance as affected by growth cracks, worm injury, disease, and edible quality of the lot, should be considered carefully when appealing to the ultimate consumer. (Figs. 2 and 3.)

When bunches are irregularly graded and sized (fig. 4) it is to be expected that early retail purchasers will pick over the lot to select the best. The remaining bunches are usually small, poorly graded, and, because of the frequent handling to which they have been subjected, present an unattractive appearance. If all bunches are uniformly graded and well sorted as to size, excessive rehandling, with its resultant damage, is unnecessary, and the storekeeper is able to dispose of the last of his stock to better advantage.

It is true that the grading of bunched vegetables has made great strides in a

FIGURE 2.—A desirable bunch of carrots. Well-graded and uniformly sized roots present an attractive appearance

comparatively short time, but some sections have been slow to change their practices to conform to market demands, with the result that much of their former trade is passing into more progressive sections where graded products may be more easily secured.

Careful handling in harvesting is important when vegetables are to be shipped long distances. The keeping quality of every vege-

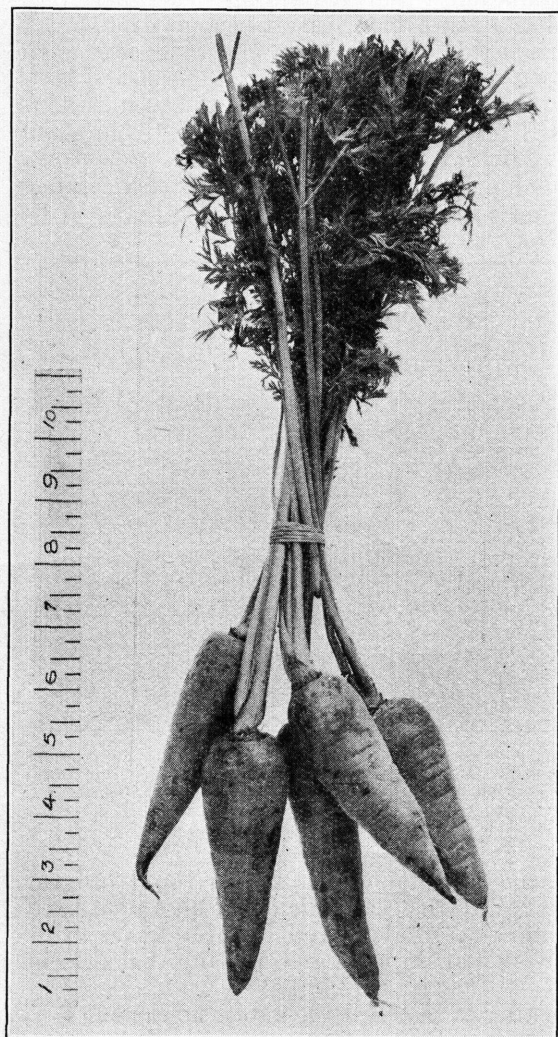


table is injured by cuts and bruises. Care should be exercised in all handling operations to prevent broken or badly bruised leaves and stems. Such injuries permit the entrance of decay organisms into the plant, and deterioration in condition results. Most of these decay organisms can not enter a sound vegetable with an unbroken skin.

Undersized roots, yellow tops of carrots, and decayed tops of beets are the principal causes for rejection at the terminal markets.

Grading should begin in the field under careful supervision, and a final check should be made at the packing or loading shed. Undersized and badly misshapen roots or those which show deep growth cracks or grub injury should be discarded, and discolored or decayed leaves should be removed. (Figs. 5 and 6.) It is less expensive to remove culls in the field than at the packing shed, and it is far more economical to remove defective stock at the shipping point than at the receiving market, where labor costs are high and working space is limited.

BUNCHING

The most common practice in bunching beets, carrots, or turnips is to tie together roots of approximately the same size.

The number of roots placed in each bunch depends upon the size of the individual specimens. In shipping sections where the roots are mostly marketed when they are $1\frac{1}{2}$ to $3\frac{1}{2}$ inches in diameter the plan usually followed is to place three large roots, four of medium size, or five or six small roots in a bunch, so that each bunch will contain practically the same quantity of edible roots.

In California a common practice is to tie in a bunch 8 to 12 or sometimes 14 carrots 1 inch or less in diameter, 6 to 8 carrots 1 to $1\frac{1}{2}$ inches,

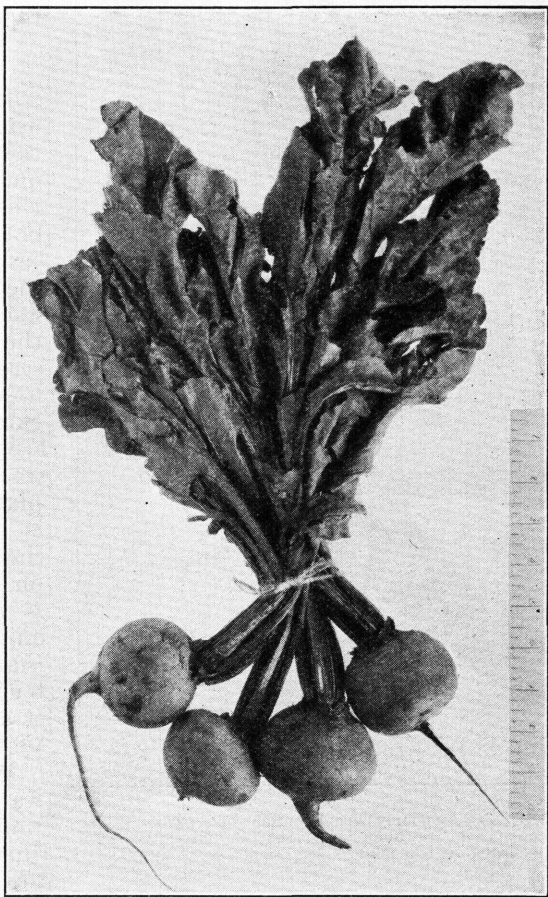


FIGURE 3.—A bunch of well-graded beets, with fresh tops and smooth, uniformly sized roots

and 4 to 6 carrots of $1\frac{1}{2}$ to 2 inches in diameter. The practice varies with different sections and shippers. The general plan is to have each bunch weigh approximately 1 pound regardless of the number of individual carrots in the bunch.

Bunches are tied 2 or 3 inches above the roots with palmetto, raffia, cloth tape, or string.

WASHING

Bunched vegetables are usually washed before they are packed. Frequently they are merely rinsed in a tank of water, but when the roots are badly caked with dirt the bunches are usually stacked in rows along the packing shed, and a stream of water from a hose is played upon them. Sometimes bunches which are to be washed are stacked in a circle on the platform. This practice is objectionable because the dirt from the bunches on one side of the circle is washed to the bunches on the opposite side. It is a better practice to stack bunched vegetables in straight rows along the platform.

When vegetables are washed in tanks, running water should be used. If this is not practicable, the water should be

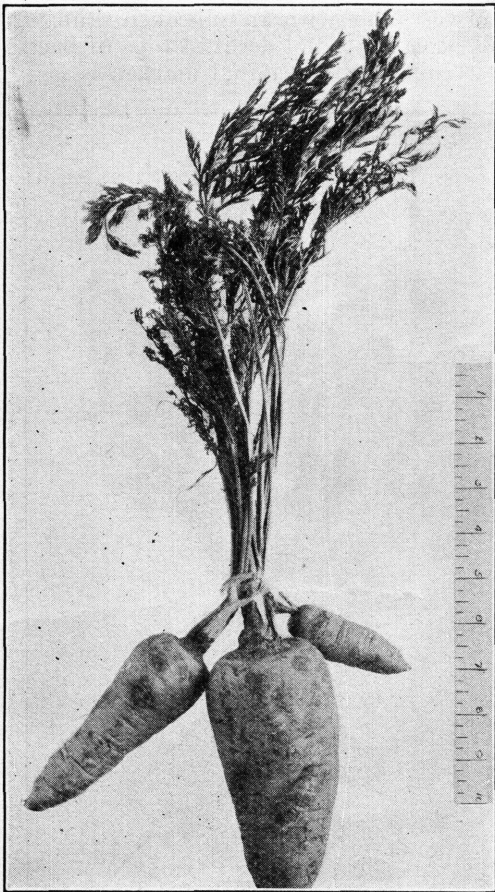


FIGURE 4.—A poorly sized bunch of carrots. The undersized specimen at right should have been discarded in the field

changed frequently enough to be kept clean. Dirty water not only spreads the microorganisms which cause decay but sometimes deposits a sediment on the leaves which may cause the vegetables to have a dirty, unattractive appearance after they have dried. This is particularly objectionable to those consumers who may wish to use the tops for greens.

PACKING

It is greatly to the advantage of all parties interested in marketing bunched vegetables that proper methods of packing in containers be employed. If containers are not well filled the waste space increases the package cost, and since freight charges are ordinarily based on an estimated per package weight, the carriers receive pay

for more than they actually carry. The vegetables are likely to be shaken and bruised in transit and discriminated against by dealers in the markets on account of their poor appearance. The price penalty paid on account of poor filling is usually much greater than the actual weight shortage warrants.

It is a common practice in packing bunched vegetables in baskets or crates to place enough bunches in the container to provide a bulge above the top of the container. When the height of the bulge is not excessive this is a desirable practice. As the natural shrinkage and settling occurs, especially in packages containing ice, the product is held securely in place until the shrinkage is sufficient to offset the bulge. The extra quantity of produce is more than paid for by the ready sale and better price which can always be secured for an attractive pack.

Bunched beets and carrots are packed either with full tops or with tops trimmed back to about 6 to 10 inches in length. The latter practice is often followed when there is a heavy leaf growth.

The large California or western type crate, as it is sometimes called, is usually lined with heavy oiled or waxed paper. Two to four pieces of paper are generally used, so placed as to lap over at the top and bottom, completely inclosing the contents after the crate is filled.

Unoled or unwaxed paper should never be used for this purpose, as water from the melting package ice or top ice often weakens the paper to such an extent that the roots break through and protrude between the slats, and become broken or bruised.



FIGURE 5.—An undesirable bunch of carrots. Rough, badly misshapen or undersized roots can not compete with well-graded stock

Three different methods are commonly used in packing the western-type crate. According to the first method, "shingle" pack, the bunches are placed lengthwise of the crate with the roots next to one end. (Fig. 7.) The layer is then completed by placing in the same direction successive bunches on the tops of the preceding bunches. When the opposite end of the crate is reached the direction of the bunches is reversed. The next and succeeding layers are arranged in

a similar manner, the direction of the bunches being reversed in each layer.

According to the second method of packing the large crate, the bunches are so placed that all roots are toward the outside of the crate, and the tops are in the center. This pack, sometimes called the "laced" pack, is started by placing four or five bunches flat on the bottom of the crate with the roots next to one end. The first layer is completed by placing several more bunches with the roots next to the opposite end of the crate. The second layer is packed in a similar manner except that the bunches are placed crosswise of the crate with the roots next to the sides. The remaining layers are packed the same as the first and second, the layers of bunches being placed alternately lengthwise and crosswise of the crate. (Figs. 8, 9, and 10.)

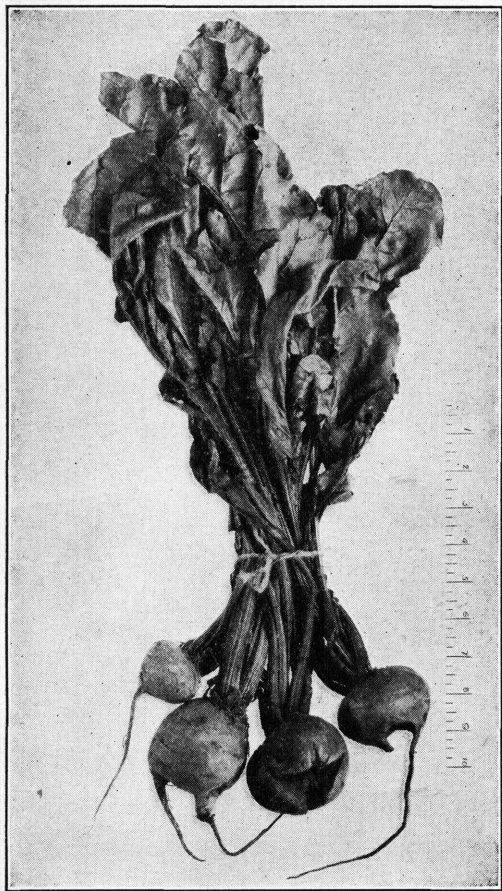


FIGURE 6.—A bunch of cull beets. The specimen at extreme left is undersized and the remainder are badly misshapen

The third method of packing the western crate differs from the second in that no bunches are placed crosswise of the crate, but are always packed so that the roots are next to the ends of the crate. A variation of this method is frequently used in California, especially when the tops are not large enough to make a desirable bulge, in which case the roots are placed in the center and the tops toward the outside of the crate.

A sufficient quantity of bunched vegetables is usually packed in each crate to insure a desirable bulge of 2 to 3 inches. (Fig. 11.) Approximately 4 to 6 dozen bunches of beets or carrots and 3 to 5 dozen bunches of turnips, depending upon the size of tops and roots, the method of packing, and the quantity of ice in the package, are packed in the western-type crate. Usually two or three scoops of crushed ice are placed in each crate, distributed in either two or three layers.



FIGURE 7.—Western-type crate, showing the first layer of the “shingle” pack. All bunches are placed in same direction, with roots on the tops of preceding bunches. When the opposite end of crate is reached the direction of the roots in the next layer is reversed

When the round stave bushel basket is used the pack is started by placing bunches flat on the bottom with the roots next to the outside of the basket. (Fig. 12.) The roots are usually placed in a ring around the sides of the basket with tops in the center, but at various stages of packing the roots are placed in the center of the container in order to fill open spaces and to insure a tight pack. Baskets are generally packed so that a bulge of 3 to 6 inches is secured. (Fig. 13.)

Usually about 4 dozen bunches of beets or carrots and $2\frac{1}{2}$ to $3\frac{1}{2}$ dozen bunches of turnips are packed in each basket, depending upon

the size of the vegetables, the number to the bunch, and the height of the bulge.

In packing bunched vegetables into barrels the first layer of bunches is placed flat on the bottom, with roots next the sides of the barrel and the tops in the center. Occasionally in the operation of packing the roots are placed in the center to fill open spaces and to insure a tight pack. After several layers of bunches have been packed, a layer of crushed ice is placed in the barrel, usually at about

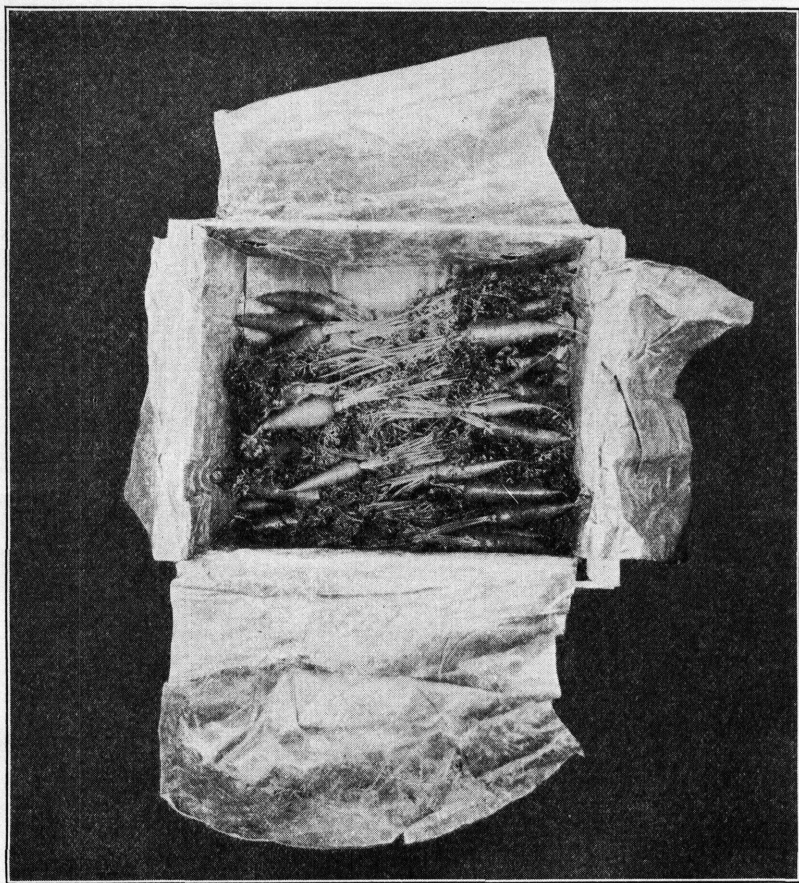


FIGURE 8.—Western-type crate, showing first layer of the “laced” pack. Bunches are placed lengthwise of crates, with roots next the ends

the middle. Several more layers of bunches are then packed to fill the barrel to within about 4 inches of the top, after which it is filled to the top with another layer of ice. The barrel is then racked to settle the contents to an extent that will permit the packing of one layer of vegetables on top of the ice, after which it is headed with a wooden cover. Usually 8 to 10 dozen bunches of beets are packed in each barrel, 10 to 12 dozen bunches of carrots, or 5 to 8 dozen bunches of turnips.

Barrels should always have one or more holes in the bottom to drain the water from melting ice.

About 24 to 26 bunches are packed in the $\frac{7}{8}$ -bushel hamper, and usually 36 to 40 bunches are packed in the small crate.

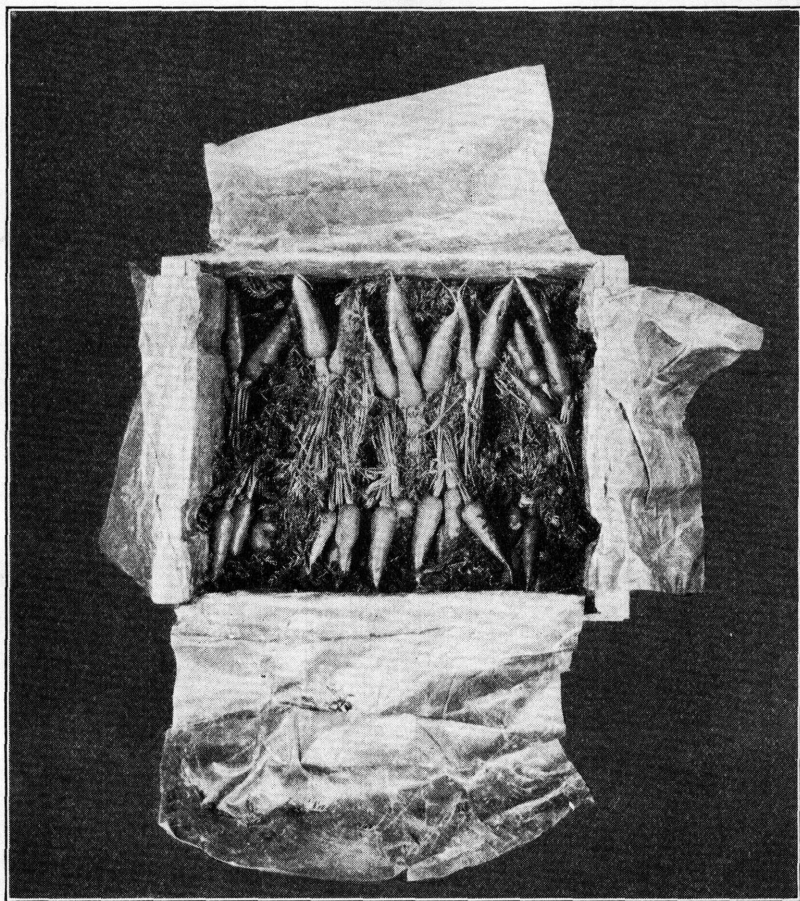


FIGURE 9.—Second layer of the "laced" pack. Bunches are placed crosswise of crate, with roots next the sides

PACKAGE ICE

Package ice is that ice which is placed inside the container with the vegetables. (Fig. 14.) Crushed or cracked ice is commonly used, the quantity depending to some extent upon weather conditions at both shipping point and in transit, more ice being used during hot weather than during cold weather.

When cracked ice is to be used it should be broken into small pieces, the smaller the better. Large chunks of ice packed into the container are liable to cut or bruise the vegetables when the cover is forced in place, especially when a desirable tight or bulge pack is secured.

Ice is always placed in double-headed barrels and usually in the large western-type crates. Package icing of round stave bushel baskets is not so common, although in some sections ice is sometimes used during hot weather. When ice is used in baskets a scoopful is placed near the top, and the basket is then neatly faced with a layer of bunched vegetables. As a rule, no package ice is used in the small crates or in hampers.

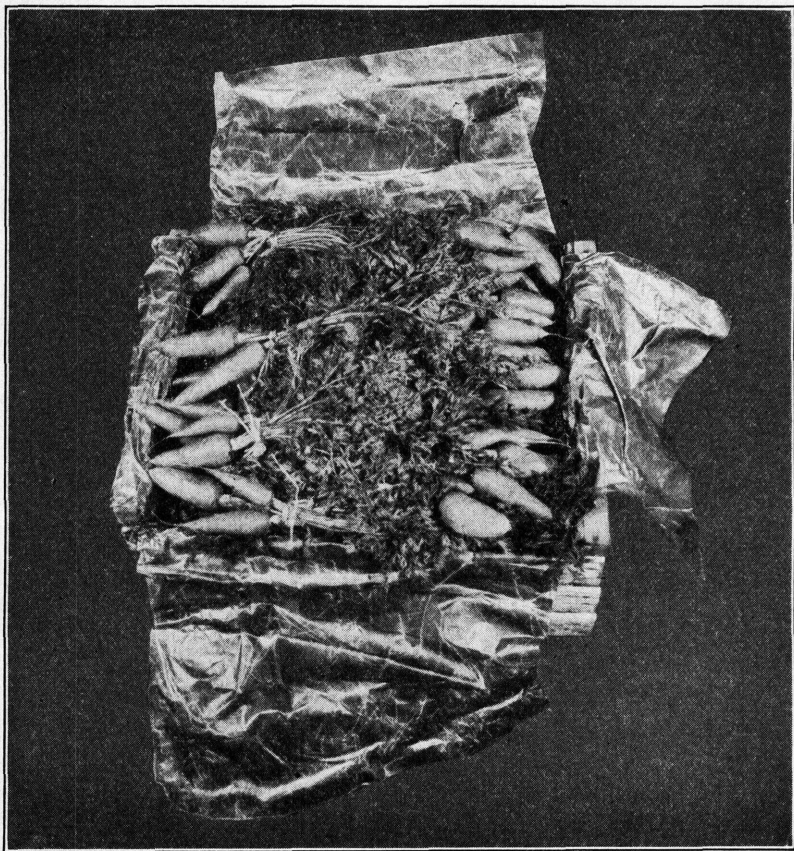


FIGURE 10.—Crate showing completed "laced" pack. Bunches in top layer are placed lengthwise of crate

Package ice is generally placed in the upper part of the container so that water from the melting ice will run down over the vegetables. When two layers of ice are used, one is placed near the middle of the container and the other is placed near the top. When only one layer is used it is generally placed near the top of the container.

CONTAINERS

A shipping container for bunched vegetables should combine strength with lightness, it should be attractive, and it should provide adequate ventilation. It should be light, because no one wishes to

pay more freight charges than necessary. It should be attractive because a large part of the buying public forms its judgments through its eyes, and the favorable impression created by an attractive package is worth considering. To insure safe arrival at market, adequate refrigeration and proper stowage in the car are necessary. If arrival in good condition is overlooked, the weeks or months of work and care which have gone into the growing of the crop may amount to nothing.

A container for the shipment of bunched vegetables, properly loaded and under normal conditions, should be strong enough to carry the commodity intact from the grower to the wholesale market and thence to the retailer. Greater strength than this is unnecessary, but too much stress can not be laid on the importance of buyers insisting that their containers be equal to the task imposed upon them.

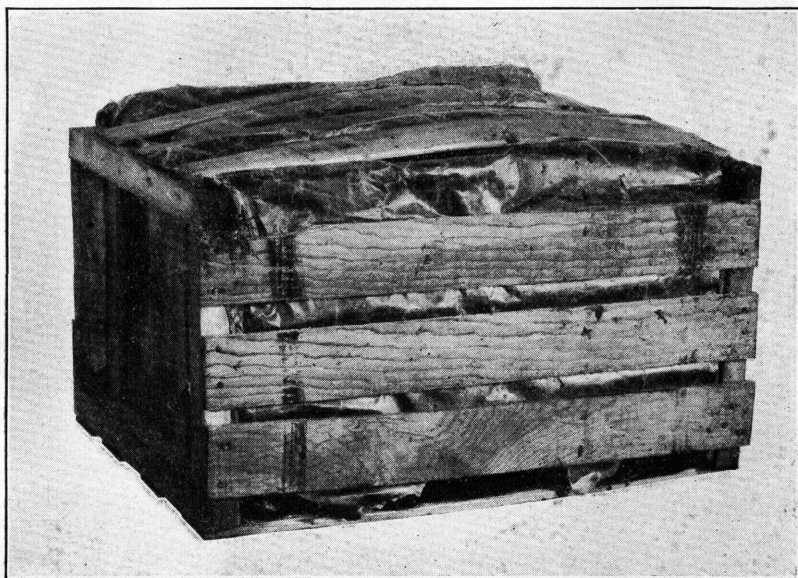


FIGURE 11.—Western-type crate of bunched carrots showing desirable bulge

Bunched carrots are shipped from California in crates similar to the large lettuce crate which has the following inside dimensions: 23½ by 18 by 13 inches.

Practically all shipments from Texas are made in round-stave bushel baskets or in the California-type crate.

Louisiana shippers use a wide variety of containers consisting of the California-type crate, the 4-bushel barrel, the round-stave bushel basket, the 1-bushel crate, and the ⅞-bushel crate. Mississippi carrots are usually shipped in ⅞-bushel hampers.

PRECOOLING

A common practice in some sections, especially when no ice is used within the container, is to place baskets of vegetables in tanks of iced water for several minutes to chill them and to freshen the tops before

they are packed. The baskets of vegetables are put into the tank at one end and are pushed along by successive baskets to the opposite end, where they are taken out and immediately loaded into refrigerator cars.

Tanks, usually made of heavy planks, vary in size. A tank 8 to 10 feet long, 4 to 5 feet wide, and 3 to 4 feet deep would probably meet the requirements of most shippers. A drain should be provided at the bottom to facilitate cleaning the tank.

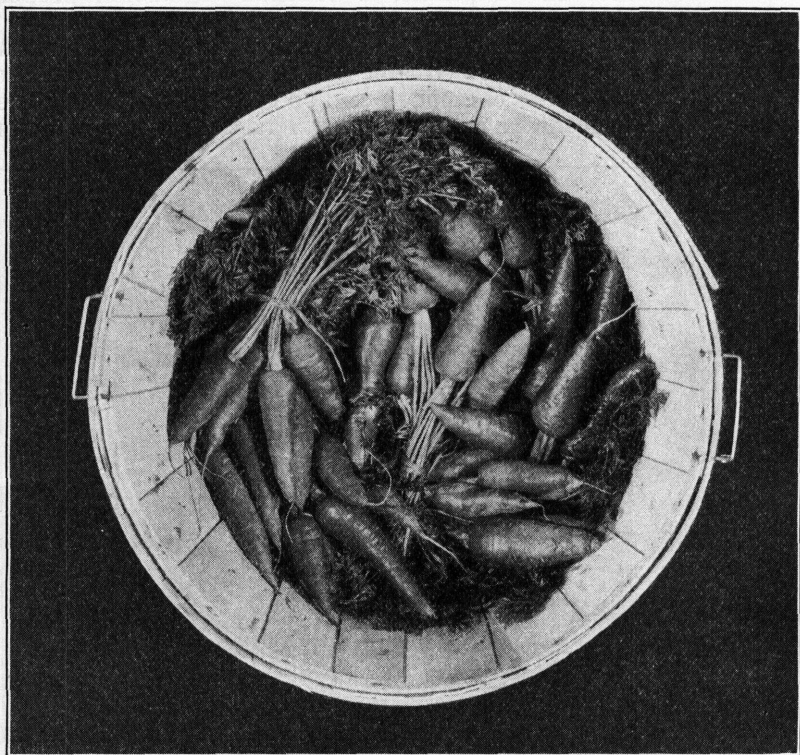


FIGURE 12.—Round stave bushel basket pack is started by placing bunches flat on the bottom with roots next the sides of the basket. Roots are then placed in the center to fill open spaces

LOADING

Bunched beets, carrots, and turnips are practically always loaded into refrigerator cars. They should be loaded into the cars as soon as possible after harvesting so as to retain their original freshness. Vegetables which have been exposed to the hot sun or to drying winds for any appreciable length of time often become so wilted that much of their disease-resistant quality is destroyed and they are more susceptible to deterioration in transit. (Fig. 15.)

The question of proper stowing and bracing of containers in car-load shipments of vegetables is worthy of careful thought on the part of shippers. That proper loading plays its part in safe arrival is

shown by the fact that some shippers obtain satisfactory results from containers with which others have trouble.

Baskets are usually loaded in five rows lengthwise of the car and stacked four tiers high. Baskets are inverted in alternate stacks, and the rows are offset as shown in Figure 16.

Small crates are placed in six or seven rows lengthwise of the car and are stacked four or five layers high. The bottom, third, and fifth layers are frequently packed seven rows wide and the second and fourth layers six rows wide. Sometimes this practice is reversed, the

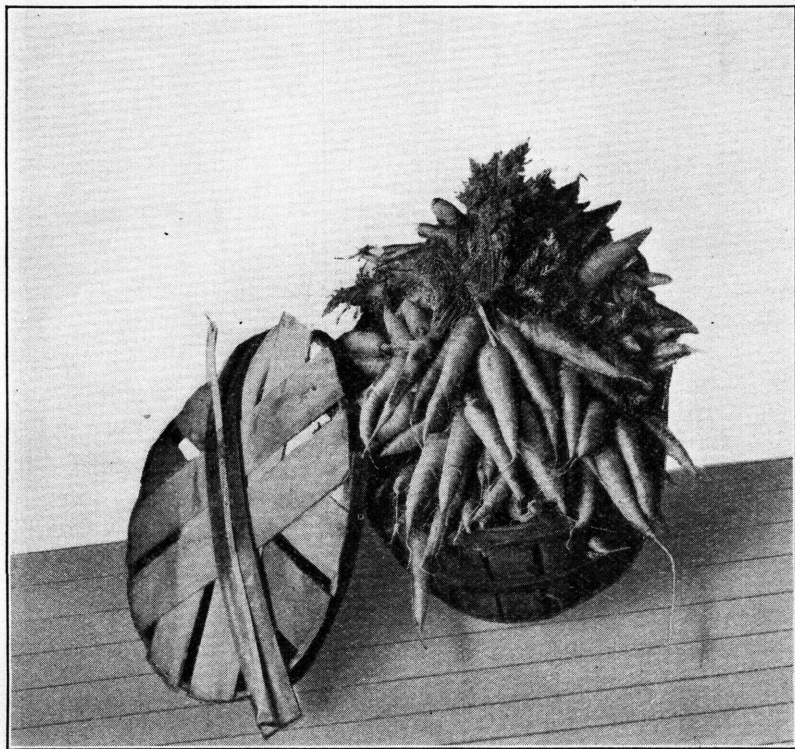


FIGURE 13.—The usual method of packing Texas carrots in baskets. Bunches are packed 3 to 6 inches above tops of baskets

bottom, third, and fifth layers being six rows wide and the remaining layers seven rows wide. Crates should be evenly spaced in the rows.

The large western-type crates are usually loaded full length of the car. Some shippers place five or six rows of crates on edge, three layers high; others pack them flat, four layers high. (Fig. 17.) There should be even spacing between the rows to permit free circulation of air. The crates should be tightly packed end to end, and each layer should be stripped and nailed to prevent side shifting. Hampers are loaded in seven rows, on end, full length of the car and stacked three or four layers high, alternate hampers being inverted.

From 2 to 5 tons of ice in the form of large chunks is usually distributed over the top of the load, except in the case of vegetables

packed in double-headed barrels. This top icing is in addition to the usual quantity of ice placed in the bunkers. Top ice is used to keep the vegetables fresh and crisp by the dripping of cold water down through the load.

Bunched beets, carrots, and turnips are sometimes shipped in bulk, usually in cars containing several other kinds of vegetables. The following description of a carload of mixed vegetables, taken from a Federal food-products inspection certificate, is an example of this

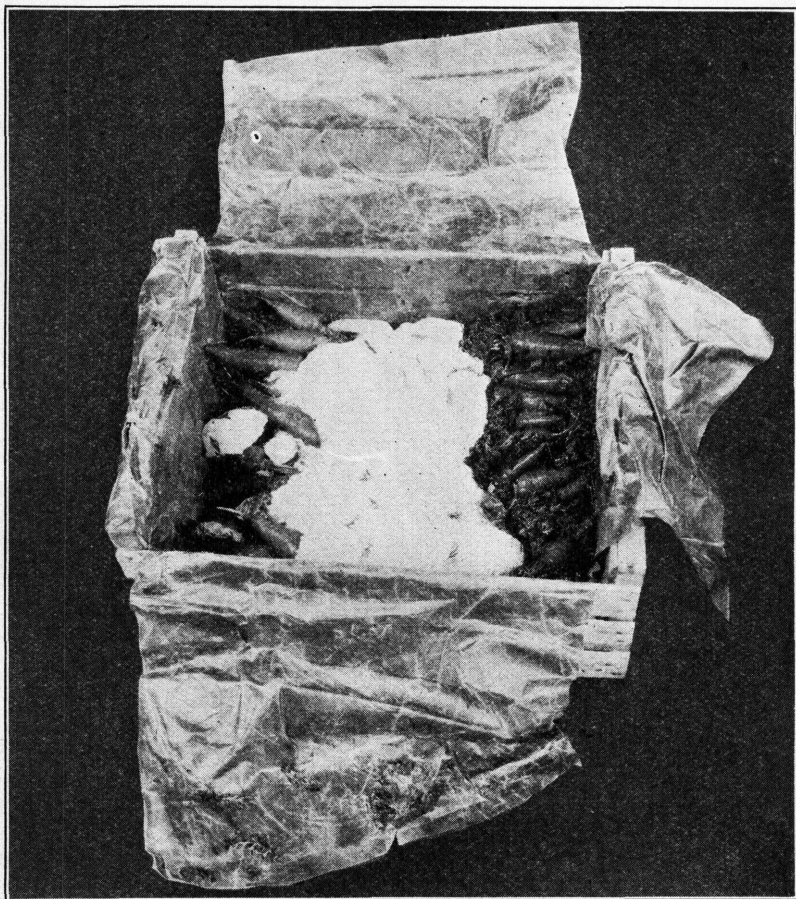


FIGURE 14.—Western-type crate of bunched carrots with layer of crushed ice in middle of crate. Package ice is used to prevent heating of vegetables

type of loading. The products loaded into the car were 200 dozen bunches of carrots, 100 dozen bunches of beets, 306 dozen bunches of turnips, 62 baskets of collards, 77 baskets of spinach, 29 baskets of mustard, 45 sacks of carrots, 25 sacks of turnips, 11 hampers of potatoes, and cabbage in bulk. In one end the beets, carrots, and turnips were stacked five to six feet deep (fig. 18), with layers of cracked ice about 12 inches apart. Six rows of baskets of mustard, spinach, and collards were stacked five layers high in the opposite



FIGURE 15.—Baskets of bunched beets stacked on open platform awaiting arrival of cars. Bunched vegetables should be loaded into cars as soon as possible after packing



FIGURE 16.—Bunched carrots in round stave bushel baskets in partly unloaded car at terminal market. Baskets are inverted in alternate stacks



FIGURE 17.—Car of bunched carrots packed in western-type crates

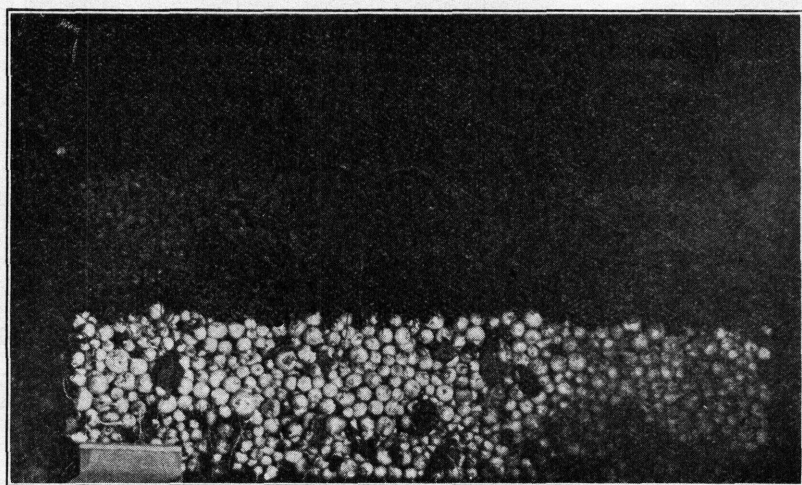


FIGURE 18.—Bunched beets and turnips stacked in bulk against the bunker of a refrigerator car

end of the car. The sacked carrots and turnips were then loaded irregularly against the collards, and potatoes were packed on top of the sacks. The remainder of the car was loaded with cabbage in bulk, which was separated by a bulkhead from the bunched vegetables.

When carloads consist of various kinds of vegetables packed in different kinds of containers and in bulk, extreme care should be used to secure as tight a loading as possible. Packages should be stacked in a uniform manner, and bulk stock should be separated from containers by suitable bulkheads. Containers of the same size and type are desirable.

REFRIGERATION

Bunched vegetables generate heat when confined in closed packages. Often this heating is the cause of shriveling or withering of the roots and the severe wilting of the tops, which permit the entrance of decay organisms. As decay progresses more heat is generated, and as the heat increases the decay organisms increase more rapidly. The result is that bunched vegetables which have not been properly iced sometimes arrive at their destination in a badly decayed condition.

Heating of bunched vegetables in transit and the subsequent deterioration may be controlled by proper refrigeration. Iced refrigerator cars should be requested sufficiently in advance to permit transportation companies to ice the cars several hours before the loading of vegetables is to begin. The purpose of this initial icing is to lower the car temperature to such a degree that the stock will be kept in a fresh condition. Warm cars delay the lowering of car temperatures and cause both top and package ice to melt more rapidly. As a result, at the end of the journey there is considerably less ice within packages and less top ice than there would have been if the vegetables had been loaded into cool cars.

Doors should always be kept closed when cars are not in process of loading. Open doorways permit the entrance of warm outside air, which soon causes the car temperatures to rise. As there is often a considerable melting of ice while loading is in progress, bunkers should be reiced as soon as possible after loading has been completed.

WHAT DOES THE RECEIVER WANT?

Shippers and growers of fruits and vegetables are often of the opinion that buyers do not know what they want. This idea is fostered by the varied wishes of different receivers or even of the same receiver at various times. These differences can often be traced to the particular terminal market for which the stock is bought or to the market receiver who has a particular trade to supply.

Some terminal markets are more discriminating and some classes of trade demand better-quality stock than others. It is well known that some markets will take stock of certain sizes or quality that another market will refuse. Even on the same market different receivers have different classes of trade to which they sell their goods.

For example, in New York City there are buyers who cater to the poorer class of trade in the lower East Side section where the poorer-quality fruits and vegetables can be sold to best advantage. On the

other hand there are other dealers on the same market, catering to the high-class hotel and restaurant trade, who are willing to pay a good price for the produce, but demand the best quality obtainable.

These varied demands of the receivers emphasize the necessity of properly grading fruits and vegetables. With graded products the best-quality stock may be sold to the best trade, and ordinary-quality stock can be disposed of to the less discriminating trade.

There are other reasons why good grading is demanded by successful dealers. As labor and rental costs in desirable locations are high, dealers must make as rapid a turnover as possible. This means that packages must be ready for customers and that resorting must be held to a minimum. Dealers know the requirements of their trade, and they try to buy goods which meet the demands. Unless the product is satisfactory to their customers dealers must make readjustments and allowances or possibly lose some of their business. Dealers want attractive products that sell quickly, that stay sold, and that bring satisfied customers who will give them repeat orders for goods.

Many shippers can not understand why receivers sometimes accept poor-quality stock without objection whereas at other times they complain of stock which is of far better quality. Often the reason there is no complaint against poor-quality products is that the market is "bare" of the particular commodity; sometimes the reason is that there is nothing but stock of inferior quality on the market.

The early season's prices for various commodities is a good example of this condition. Each year buyers pay high prices for the first cars of various products. Frequently the quality of these shipments is so poor that they would be undesirable on any market later in the season. When the market is plentifully supplied, the receiver either wants stock that will compare favorably in quality and condition with that of his competitors, or he wants stock at discount. If he can not compete in quality he must compete in price.

The more shippers can learn regarding the requirements of their markets and of the receivers in these markets the better will be their chance of selling to advantage.

INSPECTION OF BUNCHED VEGETABLES

Since the establishment of the cooperative Federal-State shipping-point inspection service great strides have been made toward the standardization of various fruits and vegetables. This has been particularly true of bunched vegetables from the South. Before this service was established growers and shippers often were unable to determine the kind of vegetables which should be classed as culls. When the market price was high almost any quality was accepted by the receivers; but when the market was declining, complaints began to pour in, and many rejections resulted. With the assistance of Federal-State inspectors it is now possible for growers and shippers to keep inferior stock down to a minimum, thus reducing rejections and often saving freight on culls.

When the shipping-point inspection service was established, the cull piles began to increase in size. Growers naturally wanted to know why. When the reason was explained they immediately sought remedies. If the trouble was due to faulty growing conditions they

sought the help of county agents or other Government agencies. If the trouble was due to rough handling they sought to correct faulty harvesting, grading, and packing practices. There soon followed a pronounced improvement in the quality of stock from that section.

Federal food-products inspectors are located in the principal market centers and will travel reasonable distances to inspect fruits and vegetables on payment of \$4 a car and expenses. An official inspection may be made by the Federal inspection service upon request by the shipper, the receiver, or other financially interested party, and is usually made in case of doubt regarding the quality or condition of the product. (Fig. 19.) A list of addresses of market offices will be furnished free if a request is addressed to the food-products



FIGURE 19.—Federal market inspector examining car of bunched carrots

inspection service, Bureau of Agricultural Economics, Washington, D. C.

Inspections are usually made on the basis of the United States grades. Copies of these grades can be secured free of charge upon application to the Bureau of Agricultural Economics, United States Department of Agriculture, Washington, D. C., as well as detailed information concerning Government inspection of fresh fruits and vegetables.

SUMMARY

The production of beets, carrots, and turnips for winter and spring shipment as fresh bunched vegetables has increased greatly during the last decade. Rapid transportation, modern methods of refrigera-

tion, better grading, and more careful harvesting practices have aided in securing wider distribution of these products.

Well-graded bunched beets, carrots, and turnips, which are carefully handled, may now be safely shipped, under proper refrigeration, to any part of the United States.

Vegetables for bunching should be placed under refrigeration as soon as possible after being harvested. Exposure to the hot sun or drying winds soon causes the tops to wilt and the roots to become flabby or shriveled.

Bunches should be carefully handled throughout all harvesting, packing, and loading operations. Rough handling often causes broken or crushed roots, stems, and leaves.

Fresh, clean vegetables appeal to the ultimate consumer. Discolored or decayed leaves should be removed, and the vegetables should be thoroughly washed with clean water before they are packed in containers.

The use of neat containers, packed in an attractive manner, gives an impression of thoroughness and carefulness in grading and packing operations. On the other hand, broken or dirty containers which have been packed in a slovenly way often give the impression that the product is poorly graded or is of such an inferior quality that the expense of good containers and good packing was not worth while.

A desirable package of bunched vegetables consists of a neat container which is well filled and attractively packed with well-graded vegetables. Bunches should be of fairly uniform size, and the individual specimens within each bunch should be fairly uniform in size. These vegetables should be clean and free from decay; the tops should be fresh and crisp, and the roots should be fairly smooth, well shaped, and in firm condition.

If shippers study the requirements of individual markets and of individual buyers in these markets they will be in a position to secure advantageous distribution of products.

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